

EXPRESS MAIL LABEL NO. EL746147222US

CLAIMS

- 1 1. An optical communication system to extend a range of data communications
2 comprising:
3 a mobile communication device;
4 an output buffer;
5 an optical transmitter associated with the device;
6 wherein the transmitter transmits optical data comprising a message bit that is
7 represented by a plurality of optical transmission pulses for each bit in the output buffer.
- 1 2. The optical communication system of claim 1, wherein the plurality of optical
2 transmission pulses are identical for each bit in the output buffer.

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1 3. An apparatus to extend a range of infrared data communication, the apparatus
2 comprising:

3 a device for receiving user inputs; and
4 an infrared transmitter associated with the device, wherein the transmitter transmits
5 infrared data as signals wherein a bit of infrared data is represented by a plurality of identical
6 pulses.

1 4. The apparatus as defined in claim 3, wherein the device for receiving user inputs
2 comprises pre-existing unmodified hardware devices selected from the group of pre-existing
3 unmodified hardware devices of: a personal data assistant, a 3Com Palm Pilot compatible
4 device, and a Windows CE based device.

1 5. The apparatus as defined in claim 3, further comprising a display for displaying a visual
2 representation of incoming signal strength.

1 6. The apparatus as defined in claim 3, wherein the incoming signal strength is measured
2 through the use of an incoming synchronization header.

1 7. The apparatus as defined in claim 3, wherein the incoming signal strength is measured
2 through a summation of received pulses.

1 8. The apparatus as defined in claim 3, wherein the incoming signal strength is measured
2 through graduation of the pulse width and therefore the energy of a synchronizing signal.

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- 1 9. The method as defined in claim 3, wherein the apparatus further comprises an infrared
- 2 receiver for receiving incoming signals from a stationary object wherein the infrared receiver
- 3 and infrared transmitter comprise a transceiver for asymmetric communication for slow
- 4 transmission and fast reception of information.

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1 10. An apparatus for receiving and transmitting infrared data communication, the
2 apparatus comprising:

- 3 a stationary object for reception of the infrared data communication; and
4 a plurality of infrared receivers spatially arranged around the apparatus.

1 11. The apparatus as defined in claim 10, wherein the plurality of infrared receivers
2 comprise electro-optical receivers.

1 12. The apparatus as defined in claim 11, wherein the stationary object comprises an
2 access point for intercommunication of infrared data.

1 13. The apparatus as defined in claim 11, further comprising a signal processor for
2 combining and reconstructing a sequence of signals into data bits and for converting data to
3 be transmitted into signals applied to high power infrared transmitters.

1 14. The apparatus as defined in claim 11, further comprising a plurality of high power
2 infrared transmitters for transmitting infrared signals to a user device wherein each infrared
3 transmitter is associated with exactly one of the plurality of infrared receivers thereby each pair
4 so arranged forming an infrared transceiver wherein a plurality of the transceivers provides
5 multiple spatially multiplexed communication channels.

1 15. The apparatus as defined in claim 14, wherein the infrared data communication
2 comprises information bits wherein each information bit is represented by a stream of
3 identical data pulses.

1 16. The apparatus as defined in claim 14, further comprising a communication channel for
2 digitally linking a signal processor with a translation device.

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1 17. The apparatus as defined in claim 16, wherein the communication channel comprises
2 a communication channel selected from the group of communication channels of: an ac
3 modem, an RF modem, an analog phone modem, an asynchronous wire and an ethernet
4 controller.

1 18. The apparatus as defined in claim 17, wherein the translation device comprises a
2 transcoder for translation of protocols, formats, commands and control logic from one
3 computing device or application to another.

1 19. The apparatus as defined in claim 18, wherein the computing device or application
2 comprises computing devices or applications selected from the group of computing devices
3 or applications of: a desktop computer, an access point, the Internet, a computer network, a
4 printer, a cellular phone, a point of sale terminal, a laptop computer and a database.

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1 20. A method for extending a range of infrared data communication between a user device
2 and another object, the method on the user device comprising the steps of:
3 receiving user inputs on a user device; and
4 transmitting infrared data as signals from an infrared transmitter associated with the
5 device, wherein a bit of infrared data is represented by a plurality of identical pulses.

1 21. The method as defined in claim 20, wherein the step of receiving user inputs includes
2 receiving user inputs on a user device comprising user pre-existing unmodified hardware
3 devices selected from the group of user pre-existing unmodified hardware devices of: a
4 personal data assistant, a 3Com Palm Pilot compatible device, and a Windows CE based
5 device.

1 22. The method as defined in claim 20, further comprising the programming instruction of:
2 displaying a visual representation of incoming signal strength on a display associated
3 with the user device.

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23. A computer readable medium containing programming instructions for extending a range of infrared data communication between a user device and another object, the method on the user device, the computer readable medium comprising the programming instructions of:

receiving user inputs on the user device; and
transmitting infrared data as signals from an infrared transmitter associated with the device, wherein a bit of infrared data is represented by a plurality of identical pulses.

24. The computer readable medium as defined in claim 23, wherein the programming instruction of receiving user inputs includes receiving user inputs on a user device comprising user pre-existing unmodified hardware devices selected from the group of user pre-existing unmodified hardware devices of: a personal data assistant, a 3Com Palm Pilot compatible device, and a Windows CE based device.

25. The computer readable medium as defined in claim 23, further comprising the programming instruction of:

displaying a visual representation of incoming signal strength on a display associated with the user device.